IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	LASCAUD, Stephane; DESCHAMPS, Marc		
Title:	ELECTROCHEMICAL GENERATOR HAVING AN ALL-SOLID-STATE POLYMERIC ELECTROLYTE COMPRISING FLUOROPOLYMERS		
Int'l. Application No.:	PCT/FR01/01379	Int'l. Filing Date:	04 May 2001
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Docket No.:	AB-1189 US		

San Jose, California
January 4, 2002

BOX PCT
COMMISSIONER FOR PATENTS
Washington, D. C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Prior to the calculation of the fees, please amend the above application as follows:

IN THE CLAIMS

1. (Amended) An all-solid-state electrochemical generator comprising a negative electrode capable of delivering a lithium cation, an all-solid-state polymeric electrolyte formed from a macromolecular material in which an ionized lithium salt is dissolved and a positive electrode capable of incorporating nonionized species corresponding to said lithium cation, characterized in that the all-solid-state polymeric electrolyte comprises one or more fluoropolymers in a macromolecular material/fluoropolymer(s) mass ratio of between 6 and 700.

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2. *The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the all-solid-state alkaline polymeric electrolyte comprises 0.1 to 10 wt% of fluoropolymer(s).*

3. *The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the all-solid-state alkaline polymeric electrolyte comprises 0.5 to 5 wt% of fluoropolymer(s).*

4. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the fluoropolymer is chosen from the group comprising the following polymers: PVDF, PHFP, PCTFE, PTFE, PVF_2, PVF.

5. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the positive electrode is made of a composite material, of an active substance, of a compound inert to electronic conduction favoring the transfer of electrical charges into a collector, such as graphite or acetylene black, and of the polymeric electrolyte.

6. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the positive electrode consists of a hybrid compound or intercalated compound comprising compounds or salts of an alkaline transition metal possessing a high electron activity with regard to alkali metals and capable of imposing on them, when they are in the ionized state, a low chemical potential with respect to that which they have when they are in the metallic state.

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7. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the positive electrode is a composite electrode comprising carbon, an active substance based on a transition metal, and a matrix of a polymeric electrolyte.

8. (Amended) The all-solid-state electrochemical generator as claimed in claim 5, characterized in that the active substance is chosen from the group consisting of vanadium oxide, manganese oxide, nickel oxide, cobalt oxide or a mixture of these active substances.

9. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the positive electrode has a thickness of between 10 and 150 μm and a proportion of active substance of between 20 and 80 wt%.

10. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the positive electrode has a thickness of between 10 and 100 μm and a proportion of active substance of between 25 and 65 wt%.

11. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the macromolecular material of the all-solid-state polymeric electrolyte is a polyether based on polyethylene oxide or polypropylene oxide, or polyoxyalkylenes.

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12. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the negative electrode is a lithium electrode.

13. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the polymeric electrolyte comprises magnesia, preferably 5 to 30 wt%, very advantageously between 8 and 25 wt%.

14. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the macromolecular material of the all-solid-state polymeric electrolyte is formed by extrusion or by coextrusion with the electrode films.

15. (Amended) The all-solid-state electrochemical generator as claimed in claim 1, characterized in that the polymeric electrolyte comprises an antioxidant compound.

16. The all-solid-state electrochemical generator as claimed in claim 15, characterized in that the proportion of antioxidant compound is between 0.5 and 3% with respect to the mass of polymer.

17. (Amended) The all-solid-state electrochemical generator as claimed in claim 15, characterized in that the antioxidant is chosen from the group comprising quinone or hydroquinone derivatives and phenolic antioxidants.

18. (Amended) An all-solid-state polymeric electrolyte formed from a macromolecular material in which an ionized lithium salt is dissolved, and comprising one or more fluoropolymers, as defined in claim 1, which is useful, in particular, for producing all-solid-state electrochemical generators as claimed in claim 1, in which the macromolecular material/fluoropolymer(s) mass ratio is between 6 and 700.

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REMARKS

Claims 1-18 are pending. Claim 1 has been amended to remove the reference numbers. Claims 4-15 and 17-18 have been amended to remove the multiple dependencies and to correct typographical errors. Thus, no charge for multiple dependent claims should be made in calculating the filing fee. Entry of this Preliminary Amendment is respectfully requested.

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Version with markings to show changes made

1. An all-solid-state electrochemical generator [(1)] comprising a negative electrode [(4)] capable of delivering a lithium cation, an all-solid-state polymeric electrolyte [(3)] formed from a macromolecular material in which an ionized lithium salt is dissolved and a positive electrode capable of incorporating [the] nonionized species corresponding to said lithium cation, characterized in that the all-solid-state polymeric electrolyte comprises one or more fluoropolymers in a macromolecular material/fluoropolymer(s) mass ratio of between 6 and 700.

4. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 3] claim 1, characterized in that the fluoropolymer is chosen from the group comprising the following polymers: PVDF, PHFP, PCTFE, PTFE, PVF_2, PVF.

5. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 4] claim 1, characterized in that the positive electrode is made of a composite material, of [the] an active substance, of a compound inert to electronic conduction favoring the transfer of electrical charges into a collector, such as graphite or acetylene black, and of the polymeric electrolyte.

6. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 5] claim 1, characterized in that the positive electrode consists of a hybrid compound or intercalated compound comprising compounds or salts of an alkaline transition metal possessing a high electron activity with regard to alkali metals and capable of

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imposing on them, when they are in the ionized state, a low chemical potential with respect to that which they have when they are in the metallic state.

7. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 6] claim 1, characterized in that the positive electrode is a composite electrode comprising carbon, an active substance based on a transition metal, and a matrix of a polymeric electrolyte.

8. The all-solid-state electrochemical generator as claimed in [either of claims 5 and 7] claim 5, characterized in that the active substance is chosen from the group consisting of vanadium oxide, manganese oxide, nickel oxide, cobalt oxide or a mixture of these active substances.

9. The all-solid-state electrochemical generator as claimed in [claims 1 to 8] claim 1, characterized in that the positive electrode has a thickness of between 10 and 150 μm and a proportion of active substance of between 20 and 80 wt%.

10. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 9] claim 1, characterized in that the positive electrode has a thickness of between 10 and 100 μm and a proportion of active substance of between 25 and 65 wt%.

11. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 10] claim 1, characterized in that the macromolecular material of the all-solid-state polymeric electrolyte is a polyether based on polyethylene oxide or polypropylene oxide, or polyoxyalkylenes.

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12. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 11] claim 1, characterized in that the negative electrode is a lithium electrode.

13. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 12] claim 1, characterized in that the polymeric electrolyte comprises magnesia, preferably 5 to 30 wt%, very advantageously between 8 and 25 wt%.

14. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 13] claim 1, characterized in that the macromolecular material of the all-solid-state polymeric electrolyte is formed by extrusion or by coextrusion with the electrode films.

15. The all-solid-state electrochemical generator as claimed in [one of claims 1 to 14] claim 1, characterized in that the polymeric electrolyte comprises an antioxidant compound.

17. The all-solid-state electrochemical generator as claimed in [either of claims 15 and 16] claim 15, characterized in that the [oxidant] antioxidant is chosen from the group comprising quinone or hydroquinone derivatives and phenolic antioxidants.

18. An all-solid-state polymeric electrolyte formed from a macromolecular material in which an ionized lithium salt is dissolved, and comprising one or more fluoropolymers, as defined in [claims 1 to 17] claim 1, which is useful, in particular, for producing all-solid-state electrochemical generators as claimed in [one of claims 1

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to 17] claim 1, in which the macromolecular material/fluoropolymer(s) mass ratio is between 6 and 700.

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